REMARKS

Claims 17-24 and 26-35 are pending in this application. By this Amendment, Applicants amend claims 17, 20, 23, 24, 27, 28, 31 and 35 and cancel claims 15, 16 and 36.

Claims 16-24 and 27-34 were rejected under 35 U.S.C. § 102(e) as being anticipated by Asai et al. (U.S. 5,779,548). Applicants respectfully traverse this rejection.

Claim 17 has been amended to recite:

"An image processing device for situating objects in virtual space by a computer system, developing a game while controlling the movements of said objects according to input control and set rules, and displaying circumstances in said virtual space as the screen seen from a virtual camera, wherein said image processing device is characterized by comprising:
polygons forming lines situated along a reference plane serving as the reference in said virtual space;
determination means for determining the positional relationship between said polygons and said virtual camera; and
polygon tilting means for tilting said polygons, according to the results of the determination, so as to increase the surface area of said polygons seen from said virtual camera to improve the visibility of the polygons from the virtual camera." (Emphasis added)

Claims 24, 27, 28, 31 and 35 have been amended to recite features that are similar to the features recited in claim 17, including the emphasized features.

In conventional game devices, when the vertical angle of a virtual camera with respect to a playing field is reduced, the lines marking a playing field gradually disappear from the display screen. Additionally, when a line vector of one or more of the lines of the playing field and a camera's eye direction vector are parallel, the lines of the playing field become so fine that they cannot be displayed on a two-dimensional display screen.

To overcome the above-described problems with conventional game devices, the present claimed invention provides an image processing device that modifies the positional coordinates of some of the vertices of line polygons marking the playing field,

such that, regardless of the virtual camera angle with respect to the playing field, the lines are always visible. Particularly, the surface area of line polygons projected by the camera is increased by slightly elevating the height position of the vertices located farther away from the virtual camera.

The Examiner alleges that Asai teaches all of the features recited in claim 17, and alleges that col. 12, lines 1-24 of Asai as discloses all of these claimed features. However, this portion of Asai discloses "an object is composed of a set of polygons representing a head, arms, legs, and a torso. . . . the data of the object comprises absolute coordinates, the type of constituent polygons, and absolute coordinates and relative coordinates of the polygons." This portion of Asai is directed to enabling a game player to replay a previously played portion of the game, and to view the replay from a number of different perspectives. In the replay mode, "information regarding the position, direction, zooming in and zooming out of the camera is entered from the control pad by the operator" (col. 7, lines 57-59). Thus, to change the perspective of the camera view in the replay mode, the operator must manually input a command, e.g. to zoom in.

The present invention recited in claims 17, 24, 27, 28, 31 and 35 of the present application provides a "polygons forming lines situated along a reference plane", "determination means for determining the positional relationship between said polygons and said virtual camera", and "polygon tilting means for tilting said polygons, according to the results of the determination, so as to increase the surface area of said polygons seen from said virtual camera to improve the visibility of the polygons from the virtual camera". In contrast, the polygons disclosed in Asai define a head, arms, legs, and a torso, **not** lines situated on a reference plane. Further, Asai clearly fails to teach or suggest any determination means that determines the positional relationship between polygons forming lines, and polygon tilting means as recited in claims 17, 24, 27, 28, 31 and 35 of the present application.

Accordingly, Applicants respectfully submit that Asai fails to teach or suggest the unique combination of elements recited in claims 17, 24, 27, 28, 31 and 35 of the present application.

Claim 20 has been amended to recite:

"An image processing device for situating objects in virtual space formed by a computer system, developing a game while controlling the movement of said objects according to input control and set rules, and displaying circumstances in said virtual space as the screen seen from a virtual camera, wherein said image processing device is characterized by comprising:
  determination means for determining whether or not said objects are in a specific area in said virtual space; and
  camera angle adjusting means for adjusting the angle of said virtual camera based on the results of the determination by said determination means; wherein
  the angle of the virtual camera is 0 degrees when said object is not in said specific area, and the angle of the virtual camera is adjusted by the camera angle adjusting means to a value other than 0 degrees when said object is in said specific area." (Emphasis added)

Claim 23 has been amended to recite features that are similar to the features recited in claim 20, except the camera angle adjusting means is replaced by "zoom adjusting means for adjusting the range of the field of vision of said virtual camera based on the results of said determination means".

The Examiner alleges that Asai teaches all of the features recited in claims 20 and 23, and refers to col. 9, lines 42-55 and col. 14, lines 61-67 of Asai. However, as noted above, Asai is directed to a device that enables previously played portions of a game to be replayed from different perspectives that the perspective in which the previously played portions were originally displayed. The different perspectives must be manually selected by the operator.

Claims 20 and 23 provide "determination means for determining whether or not said objects are in a specific area in said virtual space". Asai fails to recognize the importance of adjusting the camera angle (claim 20) or the camera zoom (claim 23) based on whether or not objects are in a specific area in the virtual space, and certainly fails to teach or suggest "determination means for determining whether or not said objects are in a specific area in said virtual space".

Further, Asai clearly fails to teach or suggest "camera angle adjusting means for

adjusting the angle of said virtual camera **based on the results of the determination by said determination means**" or "zoom adjusting means for adjusting the range of the field of vision of said virtual camera **based on the results of said determination means**" (Emphasis added).

Accordingly, Applicants respectfully submit that Asai fails to teach or suggest the unique combination of elements recited in claims 20 and 23.

In view of the foregoing amendments and remarks, Applicants respectfully submit that claims 17, 20, 23, 24, 27, 28, 31 and 35 are allowable. Claims 18, 19, 21, 22, 26, 29, 30 and 32-34 depend upon claims 17, 20, 23, 24, 27, 28, 31 and 35, and are therefore allowable for at least the reasons that claims 17, 20, 23, 24, 27, 28, 31 and 35 are allowable.

In view of the foregoing Amendments and Remarks, Applicants respectfully submit that this Application is in condition for allowance. Favorable consideration and prompt allowance are respectfully solicited.

To the extent necessary, Applicants petition the Commissioner for a One-month extension of time, extending to December 31, 2001, the period for response to the Office Action dated August 31, 2001.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

17. An image processing device for situating objects in virtual space by a computer system, developing a game while controlling the movements of said objects according to input control and set rules, and displaying circumstances in said virtual space as the screen seen from a virtual camera, wherein said image processing device [is characterized by comprising] <u>comprises</u>:

polygons <u>forming lines</u> situated [on] <u>along</u> a reference plane serving as the reference in said virtual space;

determination means for determining the positional relation<u>ship</u> between said polygons and said virtual camera; and

polygon tilting means for tilting said polygons, according to the results of the determination, so as to increase the surface area of said polygons seen from said virtual camera <u>to improve the visibility of the polygons from the virtual camera</u>.

20. An image processing device for situating objects in virtual space formed by a computer system, developing a game while controlling the movement of said objects according to input control and set rules, and displaying circumstances in said virtual space as the screen seen from a virtual camera, wherein said image processing device [is characterized by comprising] <u>comprises</u>:

determination means for determining whether or not said objects are in a specific area in said virtual space; and

camera angle adjusting means for adjusting the angle of said virtual camera based on the results of <u>the determination by</u> said determination <u>means; wherein</u>

<u>the angle of the virtual camera is 0 degrees when said object is not in said specific area, and the angle of the virtual camera is adjusted by the camera angle adjusting means to a value other than 0 degrees when said object is in said specific area</u>.

23. An image processing device for situating objects in virtual space formed by a computer system, developing a game while controlling the movements of said objects according to input control and set rules, and displaying circumstances in said virtual space as the screen seen from a virtual camera, wherein said image processing device [is characterized by comprising] comprises:

determination means for determining whether or not said objects are in a specific area in said virtual space; and

zoom adjusting means for adjusting the range of the field of vision of said virtual camera based on the results of the determination by said determination means.

24. An image processing device having an image generating display means for converting virtual space constructed with a three-dimensional model [consisting of] including a plurality of polygons to two-dimensional images seen from a virtual camera in any position, and displaying them on a display device, wherein said image processing device comprises:

angle computing means for computing the angle between an eye direction vector showing the direction in which said virtual camera is facing and a normal line vector showing the orientation of the plane of certain polygons situated in said virtual space; and

polygon tilting means for changing the coordinate values of the vertices of said polygons, so that the angle computed by said angle computing means assumes a [certain] desired value, such that the visibility of the polygons from the virtual camera is improved.

27. An image processing device for displaying circumstances in virtual three-dimensional space in the form of images seen from a camera, wherein said image processing device comprises:

polygons forming lines situated [on] along a reference plane serving as a reference in said virtual three-dimensional space;

determination means for determining the positional relationship between said

polygons and said virtual camera; and

polygon tilting means for tilting said polygons, according to the results of the determination by said determination means, so as to increase the surface area of said polygons seen from the virtual camera to improve the visibility of the polygons from the virtual camera.

28. An image processing device for displaying circumstances in virtual three-dimensional space in the form of images seen from a virtual camera, wherein said image processing device comprises:

polygons forming lines situated [on] along a reference plane serving as a reference in said virtual three-dimensional space;

determination means for determining the positional relationship between said polygons and said virtual camera; and

polygon tilting means for tilting said polygons, according to the results of the determination by said determination means, so as to allow the vertices in the interior, relative to said virtual camera, of said polygons to stand out from said reference plane, while centered on the vertices in the from, relative to said virtual camera, of said polygons.

31. An image processing device for displaying circumstances in [said] virtual three-dimensional space in the form of images seen from a virtual camera, wherein said image processing device comprises:

polygons forming lines situated in said virtual three-dimensional space;

determination means for determining the positional relationship between said polygons and said virtual camera; and

polygon tilting means for tilting said polygons, according to the results determined by said determination means, so as to increase the surface area of said polygons as seen from the virtual camera to improve the visibility of said polygons.

35. A game device for situating objects in virtual space formed in a computer

system, developing a game while controlling the movements of said objects according to input control and set rules, and displaying circumstances in said virtual space on a screen as seen from a virtual camera, said game device comprising:

polygons forming lines situated [on] along a reference plane serving as [the] a reference in a virtual space; and

a position changing means for changing positions of said polygons to enlarge an area of said polygons according to the angle relationship between said virtual camera and said polygons, such that the visibility of the polygons from the virtual camera is improved.